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Dark energy oscillations in mimetic F (R) gravity

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Abstract

© 2016 American Physical Society.In this paper we address the problem of dark energy oscillations in the context of mimetic F(R) gravity with potential. The issue of dark energy oscillations can be a problem in some models of ordinary F(R) gravity, and a remedy that can make the oscillations milder is to introduce additional modifications in the functional form of the F(R) gravity. As we demonstrate, the power-law modifications are not necessary in the mimetic F(R) case, and by appropriately choosing the mimetic potential and the Lagrange multiplier, it is possible to make the oscillations almost vanish at the end of the matter domination era and during the late-time acceleration era. We examine the behavior of the dark energy equation of state parameter and of the total effective equation of state parameter as functions of the redshift, and we compare the resulting picture with the ordinary F(R) gravity case. As we also show that the present day values of the dark energy equation of state parameter and of the total effective equation of state parameter are in better agreement with the observational data, in comparison to the ordinary F(R) gravity case. Finally, we study the evolution of the growth factor as a function of the redshift for all the mimetic models we use.

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